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the whole volume of gas acted upon. Nor was the retardation so great in any case as might have been expected from the mere dilution of the oxygen and hydrogen, and the consequent mechanical obstruction to its contact with the platina. The order in which carbonic acid and these substances seemed to stand was as follows, the first interfering least with the action; *nitrous oxide, hydrogen, carbonic acid, nitrogen, oxygen*: but it is possible the plates were not equally well prepared in all the cases, and that other circumstances also were unequal; consequently more numerous experiments would be required to establish the order accurately.

385. As to cases of *retardation*, the powers of olefiant gas and carbonic oxide have been already described. Mixtures of oxygen and hydrogen, containing from $\frac{1}{10}$ -th to $\frac{7}{10}$ -th of sulphuretted hydrogen or phosphuretted hydrogen, seemed to show a little action at first, but were not further affected by the prepared plates, though in contact with them for seventy hours. When the plates were removed they had lost all power over pure oxygen and hydrogen, and the interference of these gases was therefore of a different nature from that of the two former, having permanently affected the plate.

386. A small piece of cork was dipped in sulphuret of carbon and passed up through water into a tube containing oxygen and hydrogen (374), so as to diffuse a portion of its vapour through the gases. A plate being introduced appeared at first to act a little, but after sixty-one hours the diminution was very small. Upon putting the same plate into a pure mixture of oxygen and hydrogen, it acted at once and powerfully, having apparently suffered no diminution of its force.

387. A little vapour of ether being mixed with the oxygen and hydrogen retarded the action of the plate, but did not prevent it altogether. A little of the vapour of the condensed oil-gas liquor¹ retarded the action still more, but not nearly so much as an equal volume of olefiant gas would have done. In both these cases it was the original oxygen and hydrogen which combined together, the ether and the oil-

gas vapour
remaining unaffected, and in both cases the
plates retained the
power of acting on fresh oxygen and hydrogen.
388. Spongy platina was then used in place of
the plates,
and jets of hydrogen mingled with the different
gases thrown
against it in air. The results were exactly of
the same kind,
although presented occasionally in a more
imposing form.

¹ *Philosophical Transactions*, 1825, p. 440.